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PACIFIC OCEANIC FISHERY
INVESTIGATIONS

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CARE OF GOLDFISH

Prepared in the Branch of Game-fish and Hatcheries

The Fish and Wildlife Service is concerned with the propagation of food and game fishes only and does not distribute any ornamental fishes. Certain periodicals devoted to aquarium fishes and related subjects (page 5) contain advertisements of dealers in goldfish, tropical fish, aquatic plants; in fact, anything that is needed by the aquarist.

Because of its narrow neck, the so-called fish bowl is not adapted to keeping goldfish in a healthy state; the small amount of surface will not permit the absorption of sufficient air for the well being of fish. Another objectionable feature of the bowl lies in the reflection and refraction of light rays and distortion when viewing the fish. An aquarium with straight sides is preferable. It should be rectangular in shape and of equal width at the top and bottom.

The bottom should be covered with clean sand and gravel to the depth of 1½ inches. Ordinary washed sand and pebbles that are free from soil and humus are best. One-fourth of the bottom should be planted with aquatic vegetation, treated as suggested on page 4; the ends of the roots to be embedded in the sand or gravel, preferably along the back so as to permit free movement of the fish in front. Aquarium plants generally draw most of their nourishment from the water and require merely an anchorage.

Among the most suitable plants for an aquarium are anacharis, vallisneria, and sagittaria. Anacharis (Anacharis canadensis) is a good oxygenator and at the same time provides forage for goldfish. Fanworth (Cabomba caroliniana) is a hardy species and thrives well in small aquaria. It is evergreen, will grow from cuttings, and a branch planted in the sand at the bottom of an aquarium will produce roots. These plants can be purchased from dealers. When plant and animal life in an aquarium are properly proportioned, the aquarium is said to be balanced and in that condition the water requires infrequent change.

The depth of water should be about the same as the width of the aquarium. If the water should become contaminated at any time, the fish should be removed, the aquarium thoroughly cleaned, and the water renewed. Avoid chlorinated water unless it is allowed to stand for several hours. A water supply which is not abnormally mineralized and is suitable for domestic use is satisfactory for goldfish. The temperature of the water in an indoor

aquarium may range from 50° to 80° in winter and from 65° to 80° F in summer. In arranging an aquarium, a location should be selected where the water will not be subjected to extreme changes of temperature. Goldfish prefer a temperature from 55° to 70°.

A small aquarium cannot sustain much life. The number of goldfish that can be maintained in a healthful condition will depend upon the location of the vessel, its shape, water temperature, character of plant life, size of the fish and the amount of light admitted. It is better for beginners to start with a few of the hardier varieties of goldfish, such as commons and comets, until the fundamental principles of aquarium keeping are understood. A 5 gallon aquarium is the minimum size recommended, but when possible, a larger vessel should be used. A well balanced aquarium of this size is capable of maintaining 2 goldfish (each 2 inches long, exclusive of tails). A tank 24 inches long, 12 inches wide, and 15 inches high, with a capacity of 18 gallons, makes a suitable aquarium for a living room. A receptacle of this size should maintain eight 2-inch fish of different varieties. When larger aquaria are used, the number of fishes and plants may be increased proportionately. If the fish are larger, their number should be correspondingly reduced. Maintenance of goldfish under conditions less favorable than these is possible by making frequent changes of water or by the use of some mechanical means to aerate the water.

Growing aquatic plants utilize carbon dioxide gas and give off oxygen. Growth occurs during daylight, especially when the sun is shining on the aquarium. However, at night or on cloudy days, when plants do not grow, they are of no special value as oxygenators. It is for this reason that in an apparently well-balanced aquarium, fish come to the surface and gulp air on cloudy days and nights.

Food:- Most aquarium fishes desire a variety of foods. Whatever foods are given, it should always be borne in mind that a balance of vegetable, animal, and mineral content is required. Prepared foods are for sale in pet stores and their use can be recommended to the amateur aquarist. Oatmeal and dried bread crumbs, especially if whole wheat bread, are frequently fed. Goldfish in an aquarium should be fed every day in summer and every other day in winter. It is especially important that they be fed sparingly. The main thing to guard against is the giving of more than the fish can consume at one feeding, as any excess allowed to remain in the water will eventually pollute it and produce conditions conducive to disease. Feed sparingly!

Diseases and their treatment:- Illness among goldfish becomes apparent in many ways, but as a usual thing the fins are bloodshot, the dorsal fin droops, and the affected fish is inclined to rest on the bottom of the aquarium with little or no desire for food. Where only one fish is diseased the cause may be attributed to overfeeding or some individual sickness, but if a number are ill, it is an indication that something is radically wrong, either with the food, the water, the oxygen supply, or temperature. When a fish becomes diseased, it should be removed from the aquarium immediately.

To overcome constipation, dissolve a tablespoonful of Epsom salts in a gallon of water and allow the fish to remain in the solution for a few hours,

if necessary. Then let them rest a day or two in a weaker solution of Epsom salts with a little sea salt added. Constipation may be prevented by the use of live foods, such as Daphnia or chopped earthworms, at intervals.

Treatment with dilute salt solution:- Goldfish are subject to many diseases not described in this publication, among them being inflammation of the eyes, infection of the swim bladder, and infestations by numerous parasites, both internal and external. Treatment with salt solutions is effective in controlling some diseases and parasites. In case of infection, the fish are placed in a 3 per cent solution of common table salt, 1/4 pound to a gallon of water, and allowed to remain in the bath with aeration of the solution for 30 minutes. The fish may then be placed in another vessel containing well-aerated water. If they show signs of distress during the half hour salt treatment (by turning on one side), they should be removed to fresh water. The treatment may be repeated on the following second or third day.

Weak salt solution:- A simple and effective treatment for ridding fish of parasites and during fungus infection, is to place the fish in a dilute solution of salt for a week or ten days. Practically any fish can stand this treatment. The solution should be renewed every two or three days, but in changing the fish to a fresh solution, sudden changes of temperature should be avoided. The water may be aerated, as the occasion may require, by dipping up and pouring back a number of times. Formula: 1/2 ounce coarse salt (such as used for freezing ice cream) to one gallon of water.

To destroy certain of the surface parasites, potassium permanganate, in solution, poured into the aquarium until the water takes on a light wine color, may be used. Continue this treatment for three days. After skipping a day or two, repeat. After the three day treatment, siphon the water off and replace it with fresh water.

Rearing young goldfish:- Goldfish usually begin breeding in their second year. The female deposits the spawn on the leaves and roots of aquatic plants. As the vegetation becomes covered, sprigs of it bearing the eggs should be removed and placed in suitable receptacles, which may consist of enameled pans or tubs. The vessel containing the eggs should be kept in a well lighted place where they will receive direct sunlight for a short time each day.

Attached to each little fish at birth is a yolk sac, which provides it with nourishment for about three days. After the yolk sac is absorbed, the young fish subsist on the microscopic organisms found in the water. These are too small to be seen with the unaided eye. Preparation for the production of infusoria can be purchased from dealers in aquarium and goldfish supplies..

During the early stages of their existence, goldfish should be fed six to eight times a day, only a small quantity of food being given at each feeding. In addition to the infusoria, the fish may be given a small quantity of rice flour, dust from soda or graham crackers, or a small amount of coagulated blood pressed from raw beef. After the first six weeks, the fish may be fed on small crustaceans, mosquita larvae, boiled and strained oatmeal, and other cereals of any kind. The number of feedings may also be gradually

decreased until one meal a day is being given at the end of three months. Adding green water from outdoor pools is recommended.

Ponds:- The first requisite for the rearing of goldfish in outside ponds is a temperate climate, one that is not subject to protracted periods of extreme heat or cold.

The second factor for consideration is the water supply. This should be constant and under control as far as possible at all times. The most favorable sources of water supply for a pond system is a good spring, but in its absence successful results may be obtained by piping water from a neighboring stream, provided it is of suitable volume and good quality. The source should be at a sufficient elevation to permit the water to flow by gravity from one pond to another.

Clay is the best soil to use on the bottom, as it retains water. In the event that a clay soil is not available, the excavation may be made slightly deeper than the intended depth of the pond and a 6-inch coating of clay plastered on the sides and bottom. Anyone contemplating breeding goldfish commercially should, of course, inform himself thoroughly.

Garden pools:- Concrete is the best material to use in the construction of an outside pool. The walls should be at least 4 inches thick and reinforced with iron bars. For a water-tight pool, the cement mixture should be made rather rich, thoroughly mixed dry, and again thoroughly mixed, not too wet. About 1 part cement to 2 parts sand and 4 parts coarse gravel should be used. Both the sand and gravel must be well washed. The pool should be about 30 inches deep at the center and taper up according to the design.

The process of pouring the cement should be continuous, after which the pool should be finished with a mixture consisting of one-half cement and one-half sand. Should seepage occur, it can be stopped by the application of one of the waterproofing preparations recommended by dealers in aquarium accessories or paints.

After the pool is completed, it should be filled with water and allowed to stand for three or four days; then drain off the water several times, and place two inches of sand in the bottom, stock with aquatic plants, refill with water, and let stand four or five days before introducing the fish.

Sterilizing:- For sterilizing plants, use a weak solution of potassium permanganate (5 small crystals to one quart of water for 10 minutes), washing off the permanganate before placing the plants in the aquarium.

For sterilizing tanks in which contagious or parasitic diseases have occurred, first remove the fish and use the following treatment: 1 ounce copper sulphate in 100 gallons of water.

Introduction of new fishes:- New fishes should be isolated for a week, and if they show signs of disease they should be given a daily bath for from 15 to 30 minutes for several weeks in succession. The bath should consist of a solution of potassium permanganate made up by dissolving 5 small crystals to one quart of water.

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